

## Lucy, Show Us Your Feet...

"Lucy" (the type-specimen of the *Australopithecus afarensis* creature) is the most well-known hominin fossil ever discovered. *Hominin* is a word invented by evolutionists to describe what they consider to be "ape-like" creatures, and includes modern man (*Homo sapiens*). Lucy is often portrayed as one of the "best represented" fossil finds in support of human evolution. Lucy and her kind, *Australopithecus afarensis*, are promoted as the perfect transitional form linking the reputed chimp/human common ancestor (for which there is no fossil evidence) to modern *Homo sapiens*. *Au. afarensis* can be found in virtually every textbook where the topic of human evolution is mentioned. Artist's representations of a life-like Lucy are found in museum displays all over the world. Lucy is promoted through all the popular media outlets such as *Discovery Channel*, *PBS NOVA*, *Time*, *Discover*, *National Geographic*, *Smithsonian*, etc. If you were to survey a random crowd of high school and college students regarding whether they have ever heard of the supposed "ape-like" creature, Lucy, the majority would likely raise their hands. However, essentially none of these students will have heard the full story about Lucy.



**Figure 1:** A typical artist reconstruction of Lucy shown in a figure from a popular introductory level biology textbook (Benjamin Cummings, 2011).<sup>3</sup>

Discovered by Donald Johanson and his team in 1974 in Hadar, part of the Afar region in Ethiopia, "Lucy" was thus nicknamed while the team celebrated their discovery while listening to the Beatles song, "Lucy in the Sky with Diamonds." The skeleton was 40% complete and is said to be the most complete and best preserved *Australopithecine* specimen recovered to date ("*Australopithecine*" is a broad term

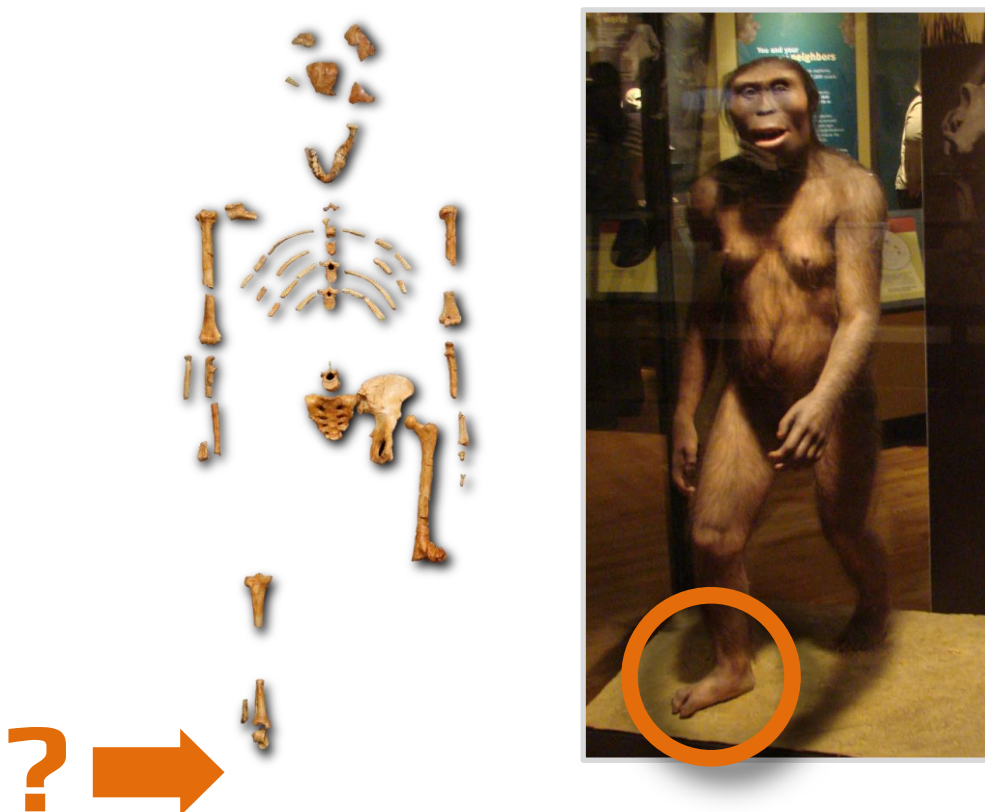
referring to all fossils of the Lucy type).<sup>1</sup> Textbooks say that although Lucy and her kind supposedly lived millions of years before modern humans evolved, *Au. afarensis* walked upright in a manner very similar to modern man.<sup>2,3</sup> Textbooks routinely show an artistic rendition of Lucy having an ape's head but from the neck down, Lucy is represented as having a fully modern human body, with a modern spine, hips, legs, hands, and feet (Figure 1).<sup>3</sup>

#### **Exhibit A: The fossil itself is incomplete, but looks to be entirely ape**

Does the actual fossil evidence suggest a human anatomy? It does not. The incomplete skeleton reveals that the size of Lucy is that of an ordinary chimpanzee, about three and a half feet high, the skull is the size and shape of a chimpanzee or similar type, and has the extended arms and shortened legs of an ordinary ape. Interestingly, the Lucy skeleton has no hands, the legs are largely absent, the feet are entirely absent, and the spine is very fragmentary (Figure 2). As Johanson himself writes in his 1979 *Science* paper that described his findings,

“... a number of skeletal elements found at Hadar (particularly some of the hand and foot bones) are either absent or poorly represented at other sites, which makes meaningful comparisons impossible.”<sup>1</sup>

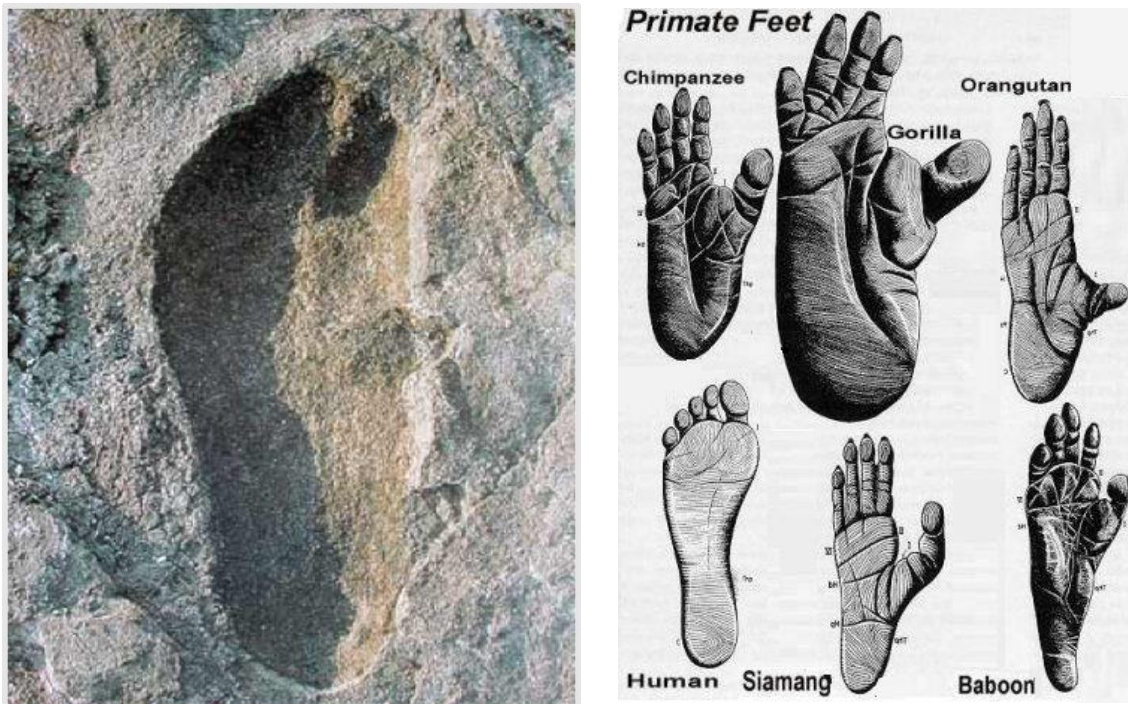
This begs the question. On what basis then, was it concluded from this fossil evidence that Lucy had human hands, hips, legs, feet, and spine?



**Figure 2:** Johanson's famous "Lucy" (specimen AL-288-1) consists of a skeleton that is 40% complete. Much of the skeleton is missing including key bones that are indicative of locomotory behavior. No hands or foot bones were recovered in 1974 from the Hadar site in Ethiopia.<sup>1</sup> Despite the missing bones, Lucy was promoted as our upright-walking ancestor with perfectly human hands and feet. To this day, artist reconstructions of a very human-looking Lucy (at least from the neck down) are shown in zoo displays, museums, and textbooks.<sup>3</sup>

## Exhibit B: Lucy's feet are missing, but some claim she left footprints...

The reason Lucy is thought to have had fully upright posture, a human gait, and had a fully human spine, hips, legs, and feet (and by extension – human hands), is because human-looking footprints have been found which are attributed to the Lucy type (Figure 3 & 4). In 1978, four years after Lucy was discovered, British paleoanthropologist Mary Leaky excavated footprints fossilized in ash located in Laetoli, Tanzania that were dated to be 3.6 million years old.<sup>4,5</sup> Meanwhile Johanson came up with an age for Lucy of about 3.2 million years old.<sup>1</sup> Remarkably, the footprints were found more than 1,000 miles away from where the fossil remains of Lucy were found, but since they seemed to date to roughly the same time period, it was assumed by evolutionary paleoanthropologists that Lucy's kind was responsible for forming the footprints. As we will see, the Laetoli footprints are indistinguishable from the footprints of modern humans.



**Figure 3:** In a side by side comparison with the feet of primates and humans, it is clear that the Laetoli footprints are morphologically most similar to humans. Researchers who have conducted in-depth analyses of Laetoli footprints, as well as the paleoanthropological community as a whole, are in agreement that the footprints are indistinguishable from modern human footprints made on a beach. As paleoanthropologist Bruce Latimer recalls, “When I saw those footprints being excavated, I thought, gosh, you’d lose these on a modern day beach, they have an arch and a totally human gait.”<sup>57</sup>

Above is a closer view of the fossilized footprints found in the volcanic ash layer, shown next to the foot shapes of human and anthropoid apes (Figure 3). It is very clear that the fossilized footprints from Laetoli lack a fundamental characteristic of all apes – a divergent hallux (a thumb-like toe used for grasping branches). The footprints are totally discordant with any type of ape feet but are indistinguishable from that of modern man – in both size and shape. As Owen Lovejoy, functional anatomist from Kent State University explains,

“When we compare the Laetoli prints to that of a chimpanzee the difference is immediately obvious. The chimpanzee which is a quadruped... still has a free great toe and that great toe extends out away from the foot and leaves a very distinct mark. On the other hand, when we compare the Laetoli print to that of a crime scene human print, they’re virtually



indistinguishable. The great toe is in line with the rest of the toes and what this has done in the human and the Laetoli print is to create an arch, and that's a hallmark of typical modern upright locomotion."<sup>61</sup>

In describing her own discovery of the Laetoli footprints, Mary Leakey acknowledges its striking similarities to modern human footprints saying,



**Figure 4:** The famous Laetoli footprints cemented in ash trailing for about 80 feet were excavated in Tanzania by the British paleoanthropologist Mary Leakey in 1978.<sup>5</sup> Trails were left by three individuals – two adults (shown by a larger and smaller print), and a child following behind occasionally stepping in the tracks of the larger adult individual. All three traveled north in parallel (possibly together). Researchers have noted the footprints of the smaller adult hint of “telltale signs that suggest whoever left the prints were burdened on one side.”<sup>61</sup> This has led some to speculate a female was carrying another child on her hip. Other researchers disagree and avoid interpretations that suggest it was a family. More recent findings that suggest the possibility of a fourth individual's footprints, another adult. Whatever the case, no paleoanthropologist doubts the footprints were made by individuals with anatomically modern human feet and a human gait.<sup>6,7,57</sup>

“Make no mistake about it ... They are like modern human footprints. If one were left in the sand of a Californian beach today, and a four-year old were asked what it was, he would instantly say that somebody had walked there. He wouldn't be able to tell it from a hundred other prints on the beach, nor would you.”<sup>6</sup>

Morphologist and former research expert on the Laetoli footprints, Russel Tuttle from the University of Chicago affirms her evaluation writing;

“In discernible features, the Laetoli G prints are *indistinguishable* from those of habitually barefoot *Homo sapiens* [emphasis added].”<sup>7</sup>

Evolutionary paleoanthropologists are in nearly universal agreement on this point. Therefore they assume Lucy must have been our upright walking ancestor. This explains why Lucy is shown in textbooks and various museums and zoo displays with an anatomically human post cranial skeleton with an upright posture fully equipped with human hands and feet. Figure 1 is an excerpt from a popular biology textbook which shows a picture of the St. Louis Zoo display of Lucy in an erect mid-stride human gait with the famous fossilized Laetoli ash prints shown in the backdrop.<sup>3</sup> Notice in the artistic reconstruction Lucy looks fully human except for the head (and she appears to be deep in thought, perhaps working out a calculus problem). Students should be aware that these artistic renditions are based on very fragmentary fossil remains. Artist imagination is used to fill in vast portions of the skeleton that are missing.

### Exhibit C: Hundreds of bones show *Au. afarensis* was not our bipedal ancestor – say experts in field

While artistic reconstructions narrate one story, the fossil evidence tells another. Looking at the actual skeletal remains of Lucy you will notice the key bones for determining locomotory behavior are missing. Contrary to fanciful textbook and museum images of Lucy, the skeletal remains do not include any hand or foot bones (Figure 2).<sup>1</sup> To make the evolutionary story work, displays superimpose on the actual fossil evidence the “correct” missing parts, produced from the imaginations of artists. For the evolutionists who were determined to promote Lucy as a missing link, these reconstructions might have seemed reasonable, especially in consideration of the human-looking Laetoli footprints (and given the assumption that both the bones and the footprints were correctly dated). However, since the discovery of Lucy in 1974, nearly 370 additional bone fragments of the Lucy-type have been found in the Hadar region, providing **real data** about Lucy’s missing hands and feet. What have paleoanthropologists actually seen?

In the *American Journal of Physical Anthropology*, paleoanthropologists Jack Stern and Randall Susman did a comprehensive analysis of a number of hand and foot bones found in Hadar, Ethiopia which were of Lucy’s type (*Au. afarensis*). With regard to the hand bones these researchers concluded:



“When all the elements of afarensis hands are considered together, one is struck by the morphologic similarity to apes. ...The markedly curved proximal phalanges indicate adaptation for suspensory and climbing activities which require powerful grasping abilities. ... A summary of the morphologic and functional abilities of the Hadar hand fossils leads inexorably to an image of a suspensory adapted hand, surprisingly similar to hands found in the small end of the pygmy chimpanzee-common chimpanzee range. The distal phalanges, too, retain ape-like features in *A. afarensis*. The proximal and middle phalanges are long, curved and have well-pronounced soft tissue markings [heavily muscled]. They can only be understood as bones that are remolded to enhance mechanical efficiency in power grasping such as occurs during climbing and suspensory behavior.”<sup>8</sup>

Stern and Susman go on to describe the small bones of the wrist (i.e., the pisiform and trapezium), which are markedly different between humans and apes. They note that *Au. afarensis*’ pisiform “resembles the pisiform of apes and monkeys,” and the trapezium “closely resembles the corresponding joint in chimpanzees.”<sup>8</sup> A wrist morphology that is strikingly similar to African apes is consistent

**Figure 5:** The fossil remains associated with Lucy’s type indicate the australopithecines had the hands and feet of ordinary apes. The hand, finger, and toe bones are long, curved, and show evidence of heavily muscled hands.<sup>8,46</sup> The presence of a divergent hallux – a grasping “toe thumb” – has also been confirmed by paleoanthropologists.<sup>11,12</sup> In addition, the bones of the distal radius reveal *Au. afarensis* was a knuckle walker.<sup>9</sup> It appears Lucy and her kind, were ordinary tree-dwelling primates – far from an upright-walking ancestor to humans.<sup>15</sup> (Image: *Nat. Geographic*, Feb. 97)

with more recent findings by Stockstad in *Science* and Richmond and Strait in the journal *Nature* where they describe Lucy and her kind as having a locking wrist that stabilizes the joint – a morphology that is “classic for knuckle walkers.”<sup>9,10</sup>

In describing the foot bones, Stern and Susman describe key features of the toe bones of *Au. afarensis* “that can only be understood as adaptations for grasping such as occurs in arboreal locomotion.”<sup>8</sup> Corroborating evidence revealed additional non-human features of the feet, including “divergent halluces” – the large “foot thumbs” that are used for grasping typical of living apes (this was also confirmed in at least two other studies by Tuttle, 1981 and Deloison, 1991).<sup>8,11,12</sup> This led Stern and Susman to challenge the idea that Lucy’s type could have formed the Laetoli footprints. They write, “... no chimpanzee prints in which the big toe was brought as close to the lateral toes as in the Laetoli prints.” Their final conclusion was that *Au. afarensis* could not have been a strong walker. They write:

“There is no evidence that any extant primate has long, curved, heavily muscled hands and feet for any purpose other than to meet the demands of full or part-time arboreal life.”<sup>8</sup>

In an annual review published in 2012, leading paleoanthropologist Craig Stanford affirms these earlier findings by Stern and Susman published in 1983 and acknowledges their assessment of the fossils is still valid and represents the consensus view held by paleoanthropologists today.<sup>13</sup> Although the majority of experts seem to agree with these earlier conclusions, textbooks and the media continue to ignore the evidence that Lucy and her kind could not have been our upright-walking ancestor.

In further agreement with these findings, at a lecture given at the American Association of Physical Anthropologists in 2005, William Harcourt-Smith of the American Museum of Natural History and Charles Hilton of Western Michigan University explained that Lucy’s type lacked a human arch and were flat-footed like modern apes (note: see appendix for a response to the newly discovered 4<sup>th</sup> metatarsal foot bone that is claimed to prove Lucy’s type had a human arch). In summarizing their research, *Scientific American* author reports, “*Au. afarensis* almost certainly did not walk like us or, by extension, like the hominids at Laetoli.”<sup>14</sup> Charles Oxnard, honorary professor of Human Anatomy at the University of California at Santa Barbara came to an even stronger conclusion with respect to the australopithecines discovered prior to Lucy’s type writing,

“... the australopithecines known over the last few decades...are now irrevocably removed from a place in the evolution of human bipedalism, possibly from a place in a group of any closer to humans than the African apes and certainly from a place in the direct human lineage”<sup>15</sup>

Oxnard explains the same conclusion could be made of Lucy’s type in light of the small cranial capacity attributed to *Au. afarensis*.<sup>15</sup>

While textbooks and the media promote a very one-sided view of *Au. afarensis* as our upright walking ancestor, a significant portion, perhaps the majority, of leading paleoanthropologists and anatomists insist just the opposite – that **the real Lucy looked nothing like our textbook images and museum displays, but rather, had hands and feet just like that of modern day tree dwelling primates** (Figure 5). With the feet and hands of a chimpanzee, Lucy and her kind could not possibly have; 1) been strong walkers; 2) stood erect; 3) had a human gait; or 4) formed the Laetoli footprints. She was 100% ape and needless to say, could not do calculus. Why has the widespread controversy among paleoanthropologists regarding Lucy’s anatomy and locomotion been kept as a trade secret? Why is there not even a trace of uncertainty communicated within textbooks or the popular press?

## Exhibit D: The Laetoli footprints – an evolutionary enigma

This leaves us with an evolutionary enigma with respect to the Laetoli footprints, which *Scientific American* describes as, “the world's oldest whodunit – an unsolved mystery.”<sup>14</sup> Think about it, ever since its discovery in 1978 the fossilized footprints supposedly 3.6 million year old have been claimed to be formed by Lucy and her kind. However, if neither Lucy nor any other *Australopithecine* fossil can be credited with having made the humanoid Laetoli footprints – where did they come from? Well aware of this problem, former researcher of the Laetoli footprints, Russell Tuttle suggests a farfetched idea,

“In any case, we should shelve the loose assumption that the Laetoli footprints were made by Lucy’s kind, *Australopithecus afarensis*. The Laetoli footprints hint that at least one other hominid roamed Africa at about the same time.”<sup>16</sup>

Realize that this so-called “loose assumption” made its way into textbooks decades ago and has remained to this day, while the more widely accepted data has been largely ignored by the media. Tuttle’s farfetched proposal reveals his unswerving faith in human evolution. He believes one day we will find fossil evidence of another species that lived at the same time as Lucy that had very human-looking feet to explain the Laetoli footprints. What he is really imagining is an archaic ape-like ancestor with anatomically modern human feet (Figure 6). His speculation does not seem even remotely reasonable. Might there be a far more obvious explanation that evolutionary paleoanthropologists have not been willing to consider? Is it possible that the footprints were formed by anatomically modern humans in more recent times – just as the evidence suggests? Tuttle actually acknowledges this would be the most reasonable interpretation if it were not for the time element. He writes,

“If the G footprints were not known to be so old, we would readily conclude that they were made by a member of our genus, *Homo*.”<sup>16</sup>



**Figure 6:** In regards to *Au. afarensis*’ chimpanzee-sized body proportions and morphology (including distinct ape-feet with a hallux), the Laetoli footprints remain a mystery to some evolutionary paleoanthropologists. Researchers have gone as far as to suggest another chimp-like species roamed Africa at the same time as Lucy’s kind, but with the awkward exception of having relatively larger *human-looking* feet (8.5 inches in length).<sup>5</sup>

## Exhibit E: Faulty dating methods

The reason why paleoanthropologists will not consider the possibility that humans made the Laetoli footprints is because according to evolution, *Homo sapiens* had not yet evolved, and they are certain their dating methods are infallible. But it turns out Johanson’s various attempts to date Lucy’s bones resulted in different ages, depending on the dating method. Initially in 1974, a volcanic ash tuff a few meters above Lucy was dated using the potassium-argon dating method but scientists ran into complications and could not arrive at a reliable age.<sup>17</sup> Because Johanson was determined to claim he had found the earliest pre-human bones, he finally settled upon dating by a stratigraphic method that gave him the date he wanted (wherein he assumed that somebody else’s date was correct for a bone from a different type of animal found in a similar layer of strata). This is hardly a conclusive dating method. It was not until years later in the early 90’s that the ash was re-dated using the argon-39-argon-40 method to yield a date that seemed appropriate for Lucy – approximately 3.2 million years old.<sup>17</sup> The

Laetoli footprints were also dated using the same basic method, which involves measuring the amount of argon in the ash. Using the potassium-argon method, a surrounding volcanic ash layer yielded an age for the footprints of about 3.6 million years old. In the *Yearbook of Physical Anthropology*, paleoanthropologist Noel Boaz openly acknowledges that the dating of the Laetoli footprints has been highly contentious. In it, Boaz describes for over a half page in length the controversy amongst evolutionists regarding the difficulties of determining the proper way to date the Laetoli footprints.<sup>18</sup>

It is crucial to realize that both of the argon dating methods used to date Lucy and the Laetoli footprints give highly discrepant ages, as reported in evolution-based scientific journals. Although the amount of argon can be measured precisely, it does not follow that the amount of argon is an accurate representation of *elapsed time*. As New Mexico's Institute of Mining and Technology's respected geochronology lab report,

"Because the K/Ar [potassium-argon] dating technique relies on determining the absolute abundances of both <sup>40</sup>Ar and potassium, **there is not a reliable way to determine if the assumptions are valid**. Argon loss and excess argon are two common problems that may cause erroneous ages to be determined. ... **excess argon can cause the calculated K/Ar age to be older than the "true" age of the dated material.**"<sup>19</sup>

Indeed, there is extensive evidence that volcanic eruptions of known age – having occurred in the very recent past – yield very much older radiometric dates. See table 1 of a list of recent volcanic eruptions that yield dates of millions of years, when dated based upon argon measurements. This recurrent problem of excess argon has been reported extensively in respected evolutionary-based scientific journals (Figure 7).<sup>20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36,37,38,39,40</sup>

If we cannot trust the dating of volcanic eruptions of known ages (recent eruptions) how can we trust the dating of those of unknown ages (unseen eruptions from the distant past)? For this reason, both of the dates in question – Lucy and the Laetoli footprints – are highly dubious, and actual ages could be much younger. If argon measurements do not give reliable dates – we cannot know the age of either Lucy or the age of the Laetoli footprints. If either of the dates is wrong – it would destroy the argument that Lucy made the footprints. This would completely invalidate the claim that Lucy walked upright or is a transitional form leading to human beings.



## Problems in the Dating of Volcanic Rocks by the Potassium-Argon Method \*

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### Abstract

The potassium-argon method is attractive for dating volcanics since it can be applied to rocks of Pleistocene age and older, thus encompassing important periods of general volcanic activity. However it has been found that dates obtained on whole rocks and on included minerals frequently show gross discordances. In order to establish this dating method in this application an attempt has been made to trace the sources of the anomalies.

To illustrate these efforts, dating results from a rhyodacite of Mauna Kuwale, Oahu, Hawaii, are reported. Determinations on several minerals and the whole rock of this ridge give a concordant age of  $2.3 \pm 0.3$  million years, excluding some few results on minerals which show old age anomalies.

It has been noted that xenoliths in certain Hawaiian volcanics contain fluid inclusions which show evidence of formation at depth. We have found that gas released from such inclusions by crushing contains radiogenic argon, and that the constituent minerals give very old potassium-argon ages (circa 800 million years). Similar gaseous inclusions have been noted in a variety of other lava phenocrysts, and their presence in a dated sample may produce an anomalous old age.

In the minerals from Mauna Kuwale sporadic occurrences of inclusions have been noted in biotites and hornblendes, and crushing of the mineral releases the excess radiogenic argon. The determination of the age of such a material would give an old age, and thus account for the anomalies found.

For meaningful dating of volcanics by the potassium-argon method it is concluded that phenocryst-containing materials should be examined for fluid inclusion content, and samples which contain these should be rejected.

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**Figure 7:** Ever since the development of the potassium-argon dating method, the scientific literature has reported numerous instances of its inability to reliably date rocks. As this early paper acknowledges, the potassium-argon dating method "frequently shows gross discordances".<sup>34</sup> Recent eruptions yielding greatly exaggerated ages continues to be documented in the scientific literature. This is due to excess argon gas that does not fully escape when the minerals crystalize.<sup>24</sup> These findings invalidate a fundamental assumption of the radioisotope dating technique (see references 20-40), and calls into question the dates assigned to the australopithecines including Lucy, as well as the Laetoli footprints.

**Table 1:** The data used in this table was retrieved from mainstream evolution-based scientific journals.<sup>20-40</sup>

Location	When Lava Extruded	Measured Age
Hualapai basalt	200 years ago	1.6 million years
Mt. Etna basalt	2,100 years ago	.25 million years
Mt. Etna basalt	29 years ago	.35 million years
Mt. Lassen basalt	85 years ago	.11 million years
Sunset Crater basalt	950 years ago	.27 million years
Kilauea basalt	<200 years ago	21 million years
Kilauea basalt	<1,000 years ago	3 million years
Kilauea basalt	<1,000 years ago	30 million years
Kilauea Iki basalt	40 years ago	8.5 million years
Mt. Stromboli	38 years ago	2.4 million years
Hualalai basalt	200 years ago	22.8 million years
Rangitoto basalt	<800 years ago	15 million years
Mt. Erebus	17 years ago	1.6 million years
Mt. Etna basalt	37 years ago	.7 million years
Medicine Lake obsidian	<500 years ago	12.6 million years

\*Literature review and compilation of listed data credited to Dr. Andrew Snellings.<sup>62</sup>

#### Exhibit F: Lucy's knees very similar to orangutan

Lucy's knee has been an object of much controversy. In his own writing's, Donald Johanson reports that the knee joint was found in strata over 200 feet (70 meters) below the strata where Lucy was found and well over a mile (2-2.5 km) away.<sup>41</sup> The knee was not found in articulation with Lucy's skeleton but discovered as an isolated bone a year earlier in 1973. Wikipedia describes the findings in more detail,

"In November 1973, near the end of the first field season, Johanson noticed a fossil of the upper end of a shinbone, which had been sliced slightly at the front. The lower end of a femur was found near it, and when he fitted them together, the angle of the knee joint clearly showed that this fossil, reference AL 129-1, was an upright walking hominid. The fossil is more than three million years old, much older than any others known at the time. The site lay about 2.5 kilometers (1.6 mi) from the site "Lucy" [AL 288-1] was subsequently found, in a rock strata 200 feet deeper than that in which the other fragments were found."<sup>42</sup>

Notice Wikipedia explains the angle of the knee joint (known as the carrying angle or the degree of valgus) "clearly showed" the bone was from an "upright walking hominid" just as Johanson reported. A high carrying angle allows the two femurs bones to point inward in a "knocked-knee" position. Lucy's carrying angle is at 15 degrees and humans are 9 degrees. Chimpanzees and gorillas, on the other hand, have a 0 degree carrying angle which makes them walk in an awkward side to side motion reminiscent of penguins. Johanson concluded that since Lucy has a high carrying angle closer to humans, Lucy and her type must have been an upright-walking hominin. However, what is not mentioned is the fact that spider monkeys and orangutans have a high carrying angle as well – it's not an attribute unique to humans at all. A high carrying angle is important for these species of primates to allow them to put one foot in front of the other to balance on branches. Moreover, upon a careful analysis of the knee, Stern and Susman report in the *American Journal of Physical Anthropology*,

"... among monkeys and apes the greatest degree of valgus [carrying angle] is found in Ateles and Pongo. As measured by Halaczek (1972), the values for bicondylar angle in 14 specimens of orangutan and 7 specimens of spider monkey overlap the range of his sample of 21 humans."<sup>8</sup>

They then make the following conclusion,

"In summary, the knee of the small Hadar hominid shares with other australopithecines a marked obliquity of the femoral shaft relative to the bicondylar plane, **but in all other respects it falls either outside the range of modern human variation** (Tardieu, 1979) or barely within it (our analysis). Since, aside from the degree of valgus [carrying angle], the knee of the small Hadar hominid possesses no modern trait to a pronounced degree, and since many of these traits may not serve to specify the precise nature of the bipedality [upright walking] that was practiced, we must agree with Tardieu **that the overall structure of the knee is compatible with a significant degree of arboreal locomotion.**"<sup>8</sup>

In addition to all of this, paleoanthropologists Richmond and Strait – as mentioned earlier – have demonstrated based on four skeletal features of the distal radius (large lower arm bone closest to wrist) that Lucy was a knuckle walker. This reveals Lucy was not an upright hominin but got around on all fours (quadrupedality). The researchers write,

"A UPGMA clustering diagram... illustrates the similarity between the radii of *A. anamensis* and *A. afarensis* and those of the knuckle-walking African apes, indicating that these hominids retain the derived wrist morphology of knuckle-walkers."<sup>9</sup>

#### **Exhibit F: Lucy's partial hip is ape, not human – but it was deliberately re-worked to appear human**

While the knee is not a good diagnostic for differentiating humans from apes, the hip is a very good diagnostic. Former anatomist of the Washington University School of Medicine, Dr. David Menton, explains these key differences:

"The part of the hip bones that we can feel just under our belt is called the iliac blade. Viewed from above, these blades are curved forward like the handles of a steering yolk on an airplane. The iliac blades of the ape, in contrast, project straight out to the side like the handlebars of a scooter. It is simply not possible to walk like a human with an apelike pelvis. On this feature alone one can easily distinguish apes from humans."<sup>43</sup>

Johanson originally reported that the actual fossil hip bone recovered appeared indistinguishable from a modern chimpanzee's when reconstructed in its most natural conformation. However, now he argues that Lucy's hip bone looks distinctly human in shape. How is this possible? It is possible because without any apology, one of Johanson's colleagues took the hip that was admittedly shaped like the hip of a chimpanzee and altered it using a power tool so it could be rebuilt to look more human – the way they wanted Lucy's hip to look. Understandably, most readers will find this very hard to believe, but Johanson and his colleague Lovejoy, proudly document what they did in a three part NOVA series, *In Search of Human Origins* – narrated by Johanson himself.<sup>44</sup>

Most people would call this academic fraud and a misrepresentation of the evidence. Apparently Johanson and Lovejoy do not see it this way. They somehow see the re-worked hip as strong evidence (manufactured by their own hands), proving to the whole world that Lucy unquestionably had human hips – and therefore walked like we walk. Consequently, textbooks and the media now claim that Lucy's hip is intermediate – as expected if she was a true transitional form. However, the original reconstruction of Lucy's hip bone was not at all intermediate. The "half-way" hip bone reconstructions in museum displays of Lucy do not represent the original bone structure that was first found by Donald Johanson in 1974. With the help of a power tool, some glue, and a healthy dose of imagination, Lucy underwent serious reconstructive hip surgery.

In the video, Johanson is the narrator. In explaining the problem with Lucy, he confesses that when the 40 pieces of the partial hipbone were reassembled it was indistinguishable from that of a living chimpanzee's and considered a "perfect fit". As Johanson explains,

"The knee looked human, but the shape of her hip didn't. Superficially, her hip resembled a chimpanzee's, which meant that Lucy couldn't possibly have walked like a modern human."<sup>44</sup>

Obviously, this was unacceptable for a "missing-link." To help solve this problem, Johanson brought in Dr. Owen Lovejoy of Kent State University to assess the fossil remains. Lovejoy concluded that it was only a coincidence that the individual pieces happened to fit together so neatly to look like a chimpanzee's hip bone. Johanson comments on this saying, "The perfect fit was an illusion that made Lucy's hip bones seems to flair out like a chimps."<sup>44</sup> Here is a written transcript of their videotaped dialogue:

**Lovejoy:** When I put the two parts of the pelvis together that we had, this part of the pelvis pressed so hard and so completely into this one that it caused it to be broken into a series of individual pieces, which were then fused together in later fossilization.

**Johanson:** After Lucy died, some of her bones lying in the mud must have been crushed or broken, perhaps by animals browsing by the lake shore.

**Lovejoy:** This has caused the two bones in fact to fit together so well that they're in an anatomically impossible position.

**Johanson:** The perfect fit was an illusion that made Lucy's hip bones seems to flair out like a chimps. But all was not lost. Lovejoy decided he could restore the pelvis to its natural shape. He didn't want to tamper with the original, so he made a copy in plaster. He cut the damaged pieces out and put them back together the way they were before Lucy died. It was a tricky job, but after taking the kink out of the pelvis, it all fit together perfectly, like a three-dimensional jigsaw puzzle. As a result, the angle of the hip looks nothing like a chimps, but a lot like ours.

Why didn't Lovejoy consider the original reconstruction of Lucy's hip bone (before the grinding tool was used) to be in an "anatomically impossible position"? The reason is because it looked too similar to a chimpanzee's hip bone – an unacceptable conclusion for Johanson and Lovejoy who were both committed to marketing Lucy as our upright-walking ancestor. Their solution was to rework the hip to look less chimp-like and more human. Johanson and Lovejoy's evolutionary interpretation was literally a force-fit.

The original reconstruction of the hip bone, on the other hand, does not require any reshaping with power tools and glue. The most reasonable explanation for why the fossil had the shape of a chimpanzee's hip bone was simply because it really *was* a chimpanzee's hip bone (or possibly another anatomically similar primate that is now extinct). The actual evidence consistently reveals that Lucy and her kind were true apes – not upright-walking hominins on their way to becoming human.

## Conclusions

Below is an overview of all of the major skeletal features of Lucy and her kind, which leading paleoanthropologists now affirm overlap extensively in morphology with ordinary apes. Contrary to the human-looking representations of *Au. afarensis* that are promoted by the media and found in textbooks and museum displays, the actual fossil evidence (summarized below) consistently shows that Lucy and her kind are not at all "ape-like" transitional forms – but ordinary primates.



- 1- The body proportions of Lucy (the most complete *Afarensis* skeleton to date) are consistent with ordinary apes. Her long arms and short legs in relation to body size, called the humerofemoral index, are proportionately similar to chimpanzees.<sup>1,45</sup> Lucy's height is also consistent with a common chimpanzee's at 3.5-4 feet tall.<sup>1</sup>
- 2- *Au. Afarensis*' finger bones are consistently found to be, "slender and are curved as markedly as in a chimpanzee, far beyond anything seen in modern humans."<sup>8</sup> Moreover, the bones of the hand show strong tissue markings that suggest they were heavily muscled which is necessary for power grasping and suspensory behavior. Stern and Susman in *the American Journal of Physical Anthropology* summarize their analysis of *Au. afarensis*' hand bones writing, "When all the elements of the *afarensis* hand are considered together, one is struck by the morphologic similarity to apes."<sup>8</sup>
- 3- Just like the hand bones, the foot bones of Lucy's type appear distinctly ape. The bones are described as long, curved, and heavily muscled.<sup>8</sup> The fossil evidence reveals *Au. afarensis* exhibited divergent halluces ("foot thumbs") as expected for limb-grasping in arboreal settings typical of living apes.<sup>11,12,46</sup> In addition, earlier papers concluded *Au. afarensis* was flat-footed as in living apes and lacked a human arch.<sup>50,51</sup> Paleoanthropologists Harcourt-Smith of the Museum of Natural History and Hilton of Western Michigan University also confirm.<sup>14</sup> The recently discovered 4<sup>th</sup> metatarsal foot bone that was reported by researchers who concluded Lucy had a human arch. However, a follow-up publication by other researchers overturned the earlier findings with a more complete analysis. They determined the single bone was morphologically most similar to the feet of modern eastern gorillas.<sup>47</sup>
- 4- Lucy's (AL 288-1) half hip bone, after its initial reconstruction was found to be indistinguishable from a modern chimpanzee's (note: this was before the hip bone was reworked by Lovejoy with a power tool).<sup>44</sup> Paleoanthropologists Stern and Susman explain that even accounting for some distortion during the fossilization process (as assumed by Johanson and Lovejoy in the video), when correcting for it, it would only make the hip bone flare out even more like a chimpanzee's. They concluded that the original reconstruction of Lucy's hip reveals its obvious similarity to chimpanzees which they deem "valid." They write, "...the fact that the anterior portion of the iliac blade faces laterally in humans, but not in chimpanzees, is obvious. The marked resemblance of AL 288-1 [Lucy's half hip bone] to the chimpanzee is equally obvious. Even allowing for postmortem distortion in the middle of the iliac crest of AL 288-1ao, it is impossible to obtain an orientation comparable to humans."<sup>8</sup>
- 5- The knee joint associated with *Au. afarensis* reveals a high carrying angle that overlaps with orangutans and spider monkeys and is therefore not a characteristic unique to humans.<sup>8,48,49</sup>
- 6- The distal radius (large bone of the lower end of the arm closest to the wrist) shows evidence of knuckle-walking locomotory behavior (quadrupedality), typical of living apes.<sup>9</sup>
- 7- The small cranial capacity (cranium volume measured in cm<sup>3</sup>) attributed to *Au. afarensis* – a range of about 380-450 cc – falls neatly within the normal chimpanzee range of 320-480 cc. It was this specific attribute that Johanson used as a basis for deciding to assign *Afarensis* to the genus *Australopithecus* as opposed to *Homo*.<sup>1</sup> Paleoanthropologist Boaz notes that the cranial capacity of *Au. Afarensis* is "the lowest known for any hominids." – the same size as modern apes.<sup>18,60</sup>

- 8- In describing the spine of Lucy which is already highly fragmentary, Johanson and colleagues originally consider it to be very similar to the human form. Later on, Stern and Susman contradicted their assessment. They write, "It has been further stated (Johanson et al., 1982b) that the anterior iliac spine of AL 288-1a0 is of a modern human form and structure. Although the spine is indeed prominent, we find that it is not of a form typical for modern humans."<sup>8</sup>
- 9- Features of *Au. afarensis*' ear, for instance, the external auditory meatus (specimen AL 335-45) "strongly resembles the pongid [great ape family] condition" as noted by Johanson.<sup>1</sup> The inner ear was carefully analyzed using a high-resolution computer tomography by Spoor and colleagues in a paper published in *Nature*.<sup>55</sup> They conclude, "... the semicircular canal dimensions in crania from southern Africa attributed to *Australopithecus* and *Paranthropus* resemble those of the extant [modern] great apes." The position of the ear itself is also consistent with living apes. Cranial remains reveal the ear would be positioned far back on the skull like a chimpanzee.<sup>54</sup>
- 10- Lucy's rib bones are fragmentary but when pieced together by experts, clearly resemble the shape of an ordinary ape's rib cage. Paleontologist Peter Schmid from the Anthropological Institute in Zurich Switzerland recognized this writing, "When I started to put the skeleton together [Lucy, AL 288-1], I expected it to look human. Everyone had talked about Lucy as being very modern, very human, so I was surprised by what I saw. I noticed that the ribs were more round in cross-section, more like what you see in apes. Human ribs are flatter in cross-section. But the shape of the rib cage itself was the biggest surprise of all. The human rib cage is barrel shaped, and I just couldn't get Lucy's ribs to fit this kind of shape. But I could get them to make a conical shaped rib cage, like what you see in apes."<sup>52</sup> In a review in the *Journal of Anatomy*, Harcourt-Smith and Aiello also affirm Lucy's "funnel shaped" rib cage that is typical of modern apes.<sup>53</sup>
- 11- Mandibles and teeth have been recovered from Hadar and Laetoli that are attributed to Lucy's type and are described as robust, similar to living apes. *Au. afarensis*' canines are reduced (but not as small as in humans), and very similar to a female bonobo chimp. A skull fragment with a sagittal crest (specimen KNM-ER 2602) was also found and attributed to *Au. Afarensis* by Johanson.<sup>18</sup> A sagittal crest is boney ridge that lines the top of the skull that serves as an attachment point for muscles. It indicates the presence of powerful jaws and heavy chewing apparatuses consistent with apes. Sagittal crests are only found on certain apes and most noticeable on the skulls of male gorillas. They are not found on humans. Moreover, in Yale Universities published book, *Shaping Humanity*, reconstruction artist John Gurche describes additional features of *Au. afarensis*' teeth bones that are consistent with living apes, particularly the irregular wear on the front teeth that resembles that of a gorilla.<sup>54</sup>
- 12- Nasal bones were found partially preserved in a few cranial fragments that are assigned to *Au. Afarensis*. Gurche describes them as lacking the nasal bone projection – a known human trait. He writes, "Their lower portions are flat and show no indications of a projecting nose." He goes on to say that the position of the nasal opening is "in a position similar to that found in many chimpanzees. Any reasonable reconstruction of nasal cartilages results in a flat, apelike nose."<sup>54</sup>

We conclude that Lucy and her kind are not a credible evolutionary link between ape and man, but are the remains of a plain ape – at best a variant of the chimpanzee or gorilla kind. A summary of the fossil evidence reveals *Australopithecus afarensis* (Lucy's type) is fully ape – clearly separate from man. This is consistent with the biblical perspective. Humans are not just highly evolved apes. We were specially created in the image and likeness of God!

#### **Appendix: 4th metatarsal mid-foot bone discovery confirms *Au. afarensis* walked upright?**

A group of paleoanthropologists who remain religiously committed to the idea that Lucy and her kind were upright-walking hominins in the direct human lineage, have recently reported in a 2011 *Science* article the discovery of a single boney element – a fourth metatarsal bone (of the mid-foot) discovered in Hadar, Ethiopia. Researchers Ward, Kimbel, and Johanson point out that the bone belongs to *Au. afarensis* and shows evidence of a longitudinal human arch (Figure 8).<sup>56</sup>

Almost immediately upon publication, the popular press exploded with news articles proclaiming to the world the latest irrefutable “proof” that *Au. afarensis* walked upright. The new findings were based on an isolated bone; a bone that supposedly put an end to the long debate over whether Lucy and her kind walked with a human gait. The mainstream media was full of headlines like the one in *Nature News* that reports, “These bones were made for walking – human-like foot arches strengthen argument that *Australopithecus* 'Lucy' was not a climber.”<sup>57</sup> And similarly publicized in *National Geographic News*, “An unprecedented fossil foot bone appears to confirm that *Australopithecus afarensis* – the early human ancestors made by the “Lucy” skeleton – walked like modern humans, a new study says.”<sup>58</sup> In the article, paleoanthropologist Latimer, who was not involved in this particular finding, confidently proclaimed, “This work certainly puts a nail in the coffin of that argument.” What all of these claims have in common is the strong emphasis that *Au. afarensis* most certainly was our upright-walking ancestor.



**Figure 8:** The 4th metatarsal mid-foot bone that Ward and colleagues claimed ended the debate over *Au. afarensis* locomotory behavior.<sup>56</sup> In 2011, the media hype proclaimed it as irrefutable proof that Lucy's type walked upright. A year later a follow up study was published in the *Journal of Comparative Human Biology* that challenged the earlier findings. Paleoanthropologists Mitchell and colleagues determined the bone was anatomically most similar to eastern gorillas.<sup>47</sup>

It is important to realize, however, that this so-called “unprecedented” finding and its accompanying sensationalized headlines are based upon a *single isolated bone*. The research was carried out by a team of paleoanthropologists who were already ideologically committed to promoting Lucy and her kind as our upright-walking ancestors (this group includes Donald Johanson, the discoverer of Lucy). Other paleoanthropologists, who hold to a competing view, disagreed with their evaluation of the 4<sup>th</sup> metatarsal bone. Researchers Mitchell and colleagues did a follow-up study a year later that challenged

the validity of the earlier paper. Here is what they concluded in a much more thorough study published in the *Journal of Comparative Human Biology*,

“Overall, AL 333-160 is most similar to the 4th MT of eastern gorillas, a slow moving quadruped that sacrifices arboreal behaviors for terrestrial ones. This study highlights evolutionary misconceptions underlying the practice of using localized anatomy and/or a single bony element to reconstruct overall locomotor behaviors and of summarizing great ape structure and behavior based on nonstatistically representative samples of only a few living great ape species.”<sup>47</sup>

In summary, these researchers rightfully charged the previous study by Ward, Johanson, and Kimbel of conducting a poor analysis – bad science. Their research was based on incomplete analysis that failed to include three out of the five great ape species. Having done a more complete analysis, they would have recognized the apparent similarities of the 4<sup>th</sup> metatarsal foot bone to that of eastern gorilla’s. In addition, they ignored much of the work from previous studies that described other key foot bones recovered from the same formation in Hadar, Ethiopia that showed *Au. afarensis* lacked a longitudinal human arch and were more flat-footed like ordinary apes.<sup>50,51</sup> At best the finding is inconclusive. They should have known better than to judge locomotory behavior from a single stray bone, especially since they have no way of knowing for sure if the bone belonged to Lucy and her kind. What is most troubling is that it is difficult to find even one popular press article discussing the more recent findings that rebutted the previously sensationalized claims.

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